1. Diagnosing Feline Allergies
   a. Symptomatic patient
      i. Pruritus
      ii. Alopecia (barbering)
      iii. Lesional
   b. Treat infections (rare)
      i. Bacterial pyoderma
      ii. Yeast paronychia
   c. Rule Out Parasites
      i. Pruritic parasites
         1. Fleas
         2. Otodectes
         3. Demodex gatoi
         4. Notoedres
         5. Sarcoptes scabei (very uncommon)
      ii. Treatment
         1. Regular flea prevention
         2. Lyme sulfur dips
         3. Ivermectin
         4. Selamectin
         5. Isoxazolines
         6. TREAT ALL PETS!

2. Food Induced Atopic Dermatitis
   a. Synonyms
      i. Cutaneous adverse food reaction
      ii. Food allergy
   b. Overall skin disease
      i. Cats 3-6%
   c. Allergic skin disease
      i. Cats 5-13%
   d. Clinical Signs in Cats
      i. Pruritus (White, 1989; Guaguère, 1993)
         1. Head & neck 42-65%
      ii. Other
         1. Miliary dermatitis
         2. Eosinophilic granulomas complex
         3. Symmetrical alopecia
      iii. GI signs
         1. Rare
   iv. Some less responsive to anti-pruritic medications
   e. Patient Criteria
      i. Pruritus or recurrent infection
         1. Nonseasonal
         2. Seasonally nonseasonal
            a. Seasonal component due to environmental allergens
         3. Undetermined
         4. Age of onset
            a. < 1 year old: 33%
            b. 1-3 years old: 51%
            c. > 4 years old: 16%
         5. No connection between recent change in diet
f. Diagnosis
   i. Elimination Diet trials
      1. Gold standard
      2. Types
         a. Novel ingredient diet
         b. Hydrolyzed diet
   ii. Allergy testing (Mueller 2017)
      1. Not recommended
      2. Low repeatability
      3. Highly variable accuracy
         a. Low as 15%
   iii. Elimination Diet Trials
      1. Choosing a diet
         a. Homecooked vs commercial
         b. Limited ingredient (LID) vs. novel protein
      2. Duration (Oliviry, 2015)
         a. Minimum of 8-12 weeks
         b. CAFR Patient remission
            i. 80% of dogs by 5 weeks
            ii. 90% of dogs by 8 weeks
            iii. 80% of cats by 6 weeks
      3. Response to Diet Trials
         a. No improvement
            i. Dx: atopic dermatitis
         b. Partial improvement
            i. Extend for 4+ weeks
            ii. Dx: atopic dermatitis +/- CAFR > rechallenge
         c. Significant improvement
            i. Dx: presumptive CAFR > rechallenge
      4. Diet Rechallenge
         a. 2 week period
         b. Return of all food items
            i. Previous diet
            ii. Treats
            iii. Medications
            iv. Supplements
            v. EVERYTHING
         c. Increase in pruritus or return of infection
            i. Dx: CAFR
         d. No change
            i. Dx: atopic dermatitis
      5. Sequential Rechallenge
         a. Feed elimination trial diet
            i. Allow pruritus and infections to resolve
         b. Single food item
            i. 2 weeks period
         c. Increase in pruritus
            i. CAFR trigger
            ii. Remove item permanently
         d. No change
            i. Nonallergic item
            ii. Can add back to diet

3. Feline Atopic Dermatitis (AD)
   a. Cutaneous clinical signs
      i. Pruritus
1. Mast cell distribution in skin
   a. Pinnae
   b. Chin

ii. Eosinophilic granuloma complex
   1. Indolent ulcers
   2. Eosinophilic plaques
   3. Linear granuloma

iii. Miliary Dermatitis

b. Non-cutaneous clinical signs
   i. Sneezing
      1. 50%
   ii. Conjunctivitis
   iii. Asthma
      1. 50% also had atopic dermatitis

c. Treatment Options for Feline AD
   i. Definitive
      1. Allergy testing with immunotherapy
         a. IDAT vs. SAT
   ii. Symptomatic
      1. Atopica for Cats
      2. Off Label Apoquel
      3. Antihistamines
      4. Steroids
   iii. Definitive therapy
      1. Feline Intradermal Allergy Testing
         a. Feline skin reactions
            i. Less prominent in regards to erythema and turgidity
            ii. Wheals more rapidly regress
         b. Fluorescein testing
            i. Diluted in saline
            ii. Administered via an IV injection
            iii. Wood's Lamp used to measure diameter
            iv. Intensity of stain does not correlate to severity of reaction
         c. Pros
            i. Testing target organ
            ii. Visibly witness mast cell degranulation
            iii. Type I hypersensitivity
            iv. More sensitive than serum testing
         d. Cons
            i. Requires sedation
            ii. Can be affected by endogenous steroid release
            iii. False positives
            iv. Medication withdrawals required
            v. Cats difficult to read
      2. Serum Allergy Testing (SAT)
         a. Pros
            i. Only requires venipuncture
            ii. Antihistamines do not interfere
         b. Cons
            i. Does not correlate with intradermal testing in cats
            ii. Measuring circulating immunoglobulins
            iii. Non-skin specific
            iv. Variable labs
            v. Monoclonal vs. polyclonal antibodies
            vi. Medication withdrawals required
3. Allergy Testing Withdrawals
   a. Steroids
      i. *Topical steroids*
         1. >14 days (ideally 30 d)
      ii. *Oral steroids*
         1. >30 days
      iii. *Injectable*
         1. 8-12 weeks
   b. Antihistamines
      i. >14 days for IDAT
   c. Fish oils
      i. >14 days

4. Saliva/Fur Testing
   a. “Inaccuracy of hair and saliva testing for allergies in dogs”
      i. K. Coyner & A. Schick
      ii. *Submitted samples for fur & saliva testing*
         1. 10 samples from known atopic dogs, non-allergic dogs, and fake “fur” from stuffed animals + tap water
         2. Positives in all categories
         3. Test results could not differentiate an allergic dog, non-allergic dog, or a stuffed animal
      iii. Not a recommended test

5. Immunotherapy
   a. How it works
      i. *Allergen tolerance*
         1. Desensitization
      ii. *Alters antigen presenting cells*
      iii. *Th2 ➔ Th1/Treg response*
      iv. *Antibody isotype switching*
         1. IgE to IgG4
   b. Subcutaneous immunotherapy (SCIT)
      i. *Every 3 days for first 3 months*
      ii. *Every 7-20 days*
      iii. Allergen-specific
         1. *Made specific for each patient*
      iv. *Aqueous allergens*
         1. *Requires refrigeration*
      v. *10-12 allergens per vaccine*
         1. *Can have multiple vxs*
      vi. *Less frequent*
         1. *Every 7-21 days*
         2. *Concentration buildup over ~3 months*
      vii. Requires needle/syringe handling
   c. Sublingual immunotherapy (SLIT)
      i. *Once to twice daily*
      ii. Allergen-specific
         1. *Made specific for each patient*
      iii. *Glycerinated allergens*
      iv. *10-12 allergens per vaccine*
         1. *Can have multiple vxs*
      v. *More frequent*
         1. *Once to twice daily*
         2. *Concentration buildup over ~3 months*
      vi. Specialized bottle
   d. Side Effects of Immunotherapy
i. Pruritus
ii. Urticaria
iii. Injection site reaction
iv. Vomiting/diarrhea
v. Anaphylaxis

e. Pros
i. Patient specific
ii. Addressing underlying immune disease
iii. Minimal long term side effects
iv. ~70% effective
v. Sublingual or subcutaneous
vi. Prevents sensitization to other allergens???

f. Cons
i. 4-12 months to efficacy
ii. Moderate expense
iii. ~30% of failure of response
iv. Symptomatic therapy

1. Atopica for Cats (cyclosporine)
   a. How It Works
      i. Calcineurin inhibitor
         1. Blocks production of IL2, IL4, TNFa
         2. Inhibits eosinophil & mast cell function/degranulation
         3. Decreases antigen presenting cells
         4. Decreases keratinocyte release of cytokines
   b. Dose
      i. Cats: 5-7mg/kg PO once daily
      ii. Taper after 30-60 days
   c. Pros
      i. 74% effective
      ii. Labeled for cats
      iii. Seasonal use
      iv. Controls pruritus & inflammation
   d. Cons
      i. Expense
      ii. Monitoring
      iii. Duration to efficacy
      iv. Side effects
         1. Vomiting
         2. Diarrhea
         3. Nausea
         4. Contraindicated in animals with history of neoplasia
      v. Requires oral administration

2. Apoquel in Canine Atopic Dermatitis
   a. How it works
      i. Primarily JAK1 Inhibitor (some JAK3)
         1. IL31 (IL2, 4, 6, & 13)
         2. Blocks IgE production, lymphocyte proliferation, cytokine/chemokine production, itch
   b. Canine dose: 0.4-0.6mg/kg PO q12h x 2 weeks, then q24h
   c. Pros
      i. Rapidly acting
         1. 1-3 hours onset
         2. Faster than Atopica
      ii. 67% efficacy
iii. Short term usage

iv. Anti-itch

v. Anti-inflammatory

d. Cons

i. Short half life

ii. Cost

iii. Contraindicated for juvenile dogs and those with history of neoplasia

iv. Not labeled for cats

e. Use of Apoquel in Cats

i. **Off label**

ii. 2 Pilot Studies

   a. 5 out of 12 cats improved
   b. Canine dosing for x 30 days
   c. No reported side effects

   a. 10 out of 15 cats improved
   b. 2.7mg PO BID x 2 weeks, then once daily for 2 weeks
   c. No reported side effects

iii. Side effects unknown

   1. Monitoring very important
   2. Exam, CBC, chem, UA??

iv. Higher dose and duration??

3. Antihistamines

   a. How it works
      i. Prevent histamine from binding to H1 receptors on cells

   b. Pros
      i. Variety
      ii. Easy to obtain
      iii. Cost*
      iv. Minimal side effects

   c. Cons
      i. ~20-30% efficacy
      ii. Cost*

4. Fatty Acids

   a. How it works
      i. Increase polyunsaturated fatty acids in skin
         1. Decrease transepidermal water loss
      ii. Alter production of leukotrienes, thromboxane and prostaglandins

   b. Pros
      i. Easy to obtain
      ii. “Natural”
      iii. Restores epidermal barrier
      iv. Improved hair coat
      v. Cheap

   c. Cons
      i. ~25% efficacy
      ii. Side effects

5. Corticosteroids

   a. How it works
      i. Blocks phospholipase A2 needed in arachidonic acid cascade
      ii. Modifies production of neurotransmitters
b. **Pros**
   i. Fast
   ii. Effective
   iii. Inexpensive
   iv. Multiple routes of administration
      1. *Injection for cats*

c. **Cons**
   i. **Side effects**
      1. Diabetes
      2. Polyuria/polydipsia
      3. Polyphagia/weight gain
      4. Anxiety/aggression
      5. Muscle atrophy
      6. Elevated liver enzymes
      7. UTI predisposition
      8. Pot belly
      9. Calciosis cutis
   ii. Monitoring bloodwork & UA

d. **Atopy Treatment: How to Choose**
   i. **Patient**
      1. Age
      2. Other illnesses
      3. Recurrent infections
      4. Response
      5. Potential side effects
   ii. **Owner’s goals**
      1. Immediate relief
      2. Control underlying disease
      3. Ability to medicate
   iii. Combination therapy